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EDITORIALS

JOHN URI LLOYD

"Upon whom, in recognition of his lifelong devotion to science in the cause of public health, is bestowed, the First Procter International Award—1934."

Dr. John Uri Lloyd.

William Procter, Jr.

EIGHTY-FIVE years rested none too lightly upon his shoulders as, in academic garb, he climbed the steps to receive from Dr. Wilmer Krusen, president of the Philadelphia College of Pharmacy and Science, a well-merited prize, the First Procter International Award.

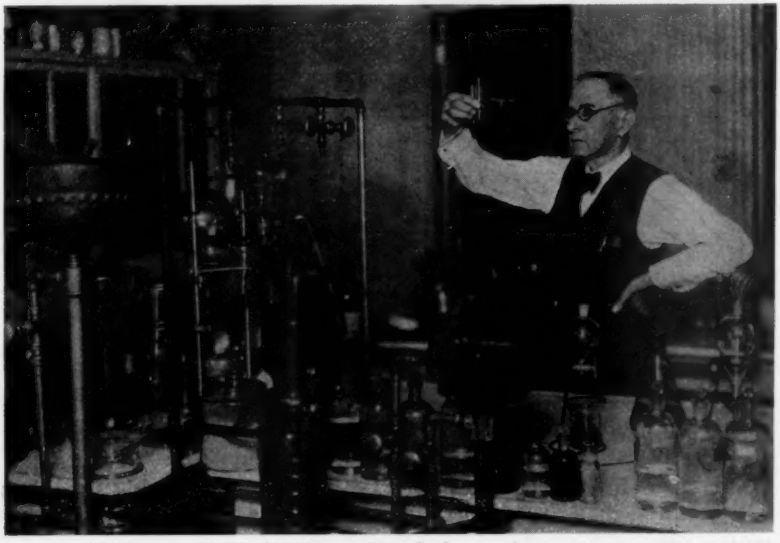
Yet when he stood up to speak he was at once alert, trigger-minded, rather quick moving and certainly belieing his four-score and five.

His head, cocked a little to one side, his blue eyes sparkling from beneath his heavy glasses, his left hand raised, forefinger pointed heavenward—just as I had seen it pointed a quarter century ago before another audience—he said "Listen, young people," and his audience, young and old, knew at once that here was a man who had a right to their ears and a right to their hearts as well.

And he did not, as many old men do, censure the present day. It was a fine philosophy of life that he uttered—a definition of service—and that the truth makes all men free.

When he had finished, and he finished long before his audience wished him to, he withdrew and passed before a host of friends, missing none and intriguing all, with his modest, kindly bearing.

Back to Cincinnati in the morning—and more than likely back to his test tubes and flasks.



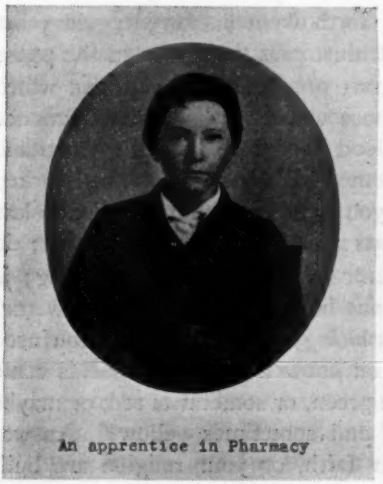
In His Workshop.

Some years ago Professor Martin H. Fischer, himself a recognized authority in the field of colloids, paid tribute to John Uri

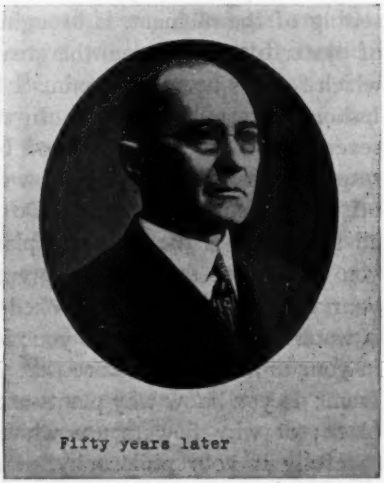
Lloyd in language so deftly arranged that it is a privilege and pleasure to quote him in full.

Said Dr. Fischer:

"To know a man you must see him at his work. To do this in the case of John Uri Lloyd you amble down a quiet side street in Cincinnati and find the pharmaceutical manufacturing concern of Lloyd Brothers—three of them, one of whom seems to watch over the more impractical two, a second who is constantly at molds and never at business, and the third who is the subject of this sketch. To find him, you enter the business office where fast work is necessary if advance is to be made. Better an appointment ahead or else



An apprentice in Pharmacy



Fifty years later

some twenty voices are likely to carry the information that the 'Professor,' as he is rightly, appreciatively, and affectionately called, is off the premises with no prospect in the visitor's life of return. And when a man's soul is in the spirit world is this not the truth? But if you can give the right sign—and an ability to discuss mass action is a better one than salesmanship—a friendly hand from a brother, a secretary, or a production manager urges you through a door. You choose between walking up four flights or taking the freight elevator. Again you feel lost until 'Edee,' who is at once cheerful presence, technical assistant, and guardian lion to the Professor, guides you

with gentle voice through dark corridors into one of two or three cubicles, immaculately clean, spotlessly in order, and strictly at work. And here, either from his desk or from over some beakers the Doctor of Science, *honoris causa,* or the 'Empiricist and Irregular,' as he calls himself, welcomes you.

I do not remember a time when, either alone or with a group of scientific friends, there was not in his first words a note of appreciation for *their* endeavors—a proof at once of his first-hand knowledge of the other man's life and the catholicity of his thought, for politicians, practical men, and theorists who put the modern builders of the atom to shame, all seek him out. Such greeting is followed by, 'May I tell you a story?' And then some pearl, fitting well into the setting of the moment, is brought forth from his seventy-odd years of oyster life which even the great must pass through. In the pause which follows he speaks again: 'I have prepared an experiment which I should like to show you.' In those who have had this experience several times, a warm rush of blood to the head is the emotional response which foretells that now some new decoration will be knocked off their scientific gargoyle. Do you hold the Guldberg-Waage law all sufficient; is the 'dew' on plants a settled question for you; do you think that the tincture preparer of 1850 knew everything; is your view of solubility a crooked one because you know only water; is water itself just H_2O to you; is biology and undertaking confused in your mind; are you sure that you know where the alkaloids come from; do you know why plants are green, or sometimes red, or maybe black; or why flowers are white and sometimes yellow? Answer carefully if your philosophy, your faith, or your religion are built up on the demonstrable in nature and not upon the interpolated texts of our scientific cook-book makers.

As you wait for a solution to filter, your eyes wander into the background. What are those vials labeled *a* to *d*? 'Just alkaloids separated from ——.' And what are those labeled I to IX. 'Another set from ——.' But you were sure that each of these infernal plants contained but one alkaloid. Quite so, but here are the rest. And knowing that fat reputations have been built upon the discovery of just one alkaloid, you ask when the Professor will publish his results. 'I am not young any more and a bit tired. Let me tell you about them and then you publish the facts.' You see on the table a pot of tar-like material. And what is that? 'Just the muck which you

"regulars" think it well to carry along with the bits of active material in your standard pharmaceuticals and which, after twenty years of work, I have learned to get out by my studies of differential solubility.' You feel that you have heard just an overtone of bitterness in his voice, but a look at his face seems to belie your impression.

You digress from the material of the demonstration to its philosophic consequences and philosophic consequences join quite naturally to the business of life itself. Is science a cloak to you which may be put on and off during convenient working hours? If so, John Uri Lloyd does not interest you for to him it is life itself. Do you find her a yoke gladly to be cast aside were the rewards of labor not so necessary? Again our man does not interest you for he follows her as lovers, romance; and children, the rainbow. Alkaloids are not things to be made into medicine, but voices which speak from another world. To be a practical man of chemistry is simply to ease the material life of a fellow that he may enjoy better the fruits of the spirit.

You rise to go. You find your way out as you came in, but you are not as conscious as you were of the externals. You are more conscious of the internals. You have lost something—some of your scientific prejudices, some of your party adherences, some of your reverences for mere tradition. Also you have gained something—a more mobile state of mind, a larger tolerance, an increased generosity. And you are conscious that this is because for a little while you have been away from commissions, committees and boards, from diagrams, formulas, and fudge, and from canned efficiency, officialism, and Main Street, and for the same length of time have lived in the presence of the one thing that moves our universe, an individual and a man who is as good a picture in flesh and blood of what science stands for as may be found in the day's journey."

Professor Lloyd is a man of many titles, for many institutions have been glad to do him honor. He can write after his name a whole alphabet of honorary degrees. The Philadelphia College of Pharmacy and Science, the oldest teaching college of pharmacy in the world, has made him a Master of Pharmacy, Honoris Causa. The Cincinnati College of Pharmacy has made him a Doctor of Pharmacy; Wilberforce, a Doctor of Law; Ohio State University, a Doctor of Philosophy; The University of Cincinnati, a Doctor of Science, and the Eclectic Medical College has created a new precedent,

bestowing for the first time a degree, Honoris Causa, in order to make him a Doctor of Medicine.

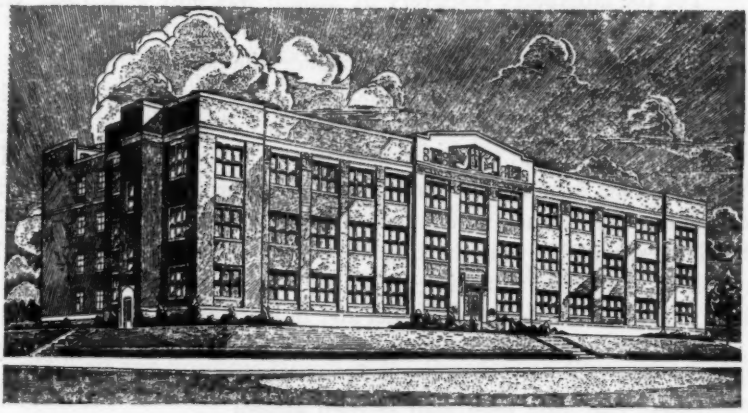
In 1920 he was also awarded the Remington Honor Medal, a high award of merit in the field of pharmacy, and a most distinguished company of scientists gathered in New York to do him honor on that occasion.

But we have his word for the fact that none of these honors gave him greater pleasure than this bestowal upon him of the Procter International Award, and particularly so because he was the very first person to whom this honor had come.

IVOR GRIFFITH.

The Identification of Therapeutically Important Barbituric Acids. J. C. Jespersen and K. Thoudahl-Larsen. *Dansk Tidss. f. Farm.* 212-226 (1934). Through *Pharm. Zeitung. 69,* 890-891 (1934). The authors have prepared xanthydrol and para-nitrobenzyl derivatives of a number of barbituric acids and determined the melting points of the derivatives. The solubility of the recrystallized acids has been determined in water at 20 degrees and 37 degrees C., the following values being reported in grams per 1000 grams of water. (Figures in parentheses represent solubility at 37 degrees C.) Diethylbarbituric (Veronal) 6.29 (9.49); isopropylbarbituric 5.96 (10.15); dipropylbarbituric 0.63 (1.08); ethyl-n-butylbarbituric 3.15 (4.88); ethylisoamylbarbituric (Amytal) 0.64 (0.99); ethylallylbarbituric (Dormin) 4.02 (6.55); isopropylellylbarbituric (Isonal) 3.40 (5.60); n-butylallylbarbituric (Idobutal) 1.51 (2.01); diallylbarbituric (Dial) 1.25 (2.53); methylphenylbarbituric 0.76 (1.34); ethylphenylbarbituric (Luminal) 0.88 (1.84); allylphenylbarbituric 1.10 (1.90); ethylcyclohexenylbarbituric (Phanodorm) 1.64 (2.25); ethylphenyl-n-methylbarbituric (Prominal) 0.15 (0.12) and methylcyclohexenyl-n-methylbarbituric (Evipan) 0.29 (0.64). The purity of the acids was checked by determinations of the melting point, nitrogen content and by bromometric titration according to the method of the Danish Pharmacopoeia (1933).

"A TEMPLE OF THE FUTURE"



The Lilly Research Laboratories.

WHAT would be the result, doctor, if the city authorities at once cut off your supply of insulin?"

Such was the question propounded to the medical director of a large municipal clinic whose annual consumption of this remarkable remedy amounts to fifty million units.

And unhesitatingly the answer came: "Within three months, three hundred would die, and within the year a thousand."

One can hardly grasp the significance of such a statement—and particularly so when the world-wide death toll is judged in the light of the lesser municipal figures.

Yet it is but slightly over a decade since Banting, the restless young Canadian, inspired by a pancreatic theory expounded by the late Dr. Moses Behrend, of Philadelphia, failed to find his rest in bed, and, rising in the middle of night, commenced his quest in earnest. For months he and his associates worked, adding their own discoveries to a host of previous findings, until at last the total sum resolved the answer—Insulin.

And with their discovery came the dawn of a new day for diabetics. A heap of sadness went out of the world and man's burdens eased upon his weary shoulders.

The old familiar dictum, "diabetics under twenty never live to see their twenty," lost its sickening significance, and the devastating

sugar sickness of life's uncertain autumn was robbed of much of its poignant terror.

Yet the laboratory discovery of insulin was only a halfway victory, for it had to be made available to all who came to seek it.

But let *International Clinics* conclude the joyous story.

"Before them however remained the joy and the job of searching for large scale methods of producing this drug in such quantities as to let the rich and the poor alike share in its healing boon. In America alone a million sufferers pleaded its prompter coming—and to this end the Canadian scientists worked incessantly on, so that in the shortest possible time the largest possible amounts might be made available. In order to achieve this they wisely sought the help of a firm well established—in personnel and in equipment.

"In the United States, the firm of Eli Lilly and Company, founded and headed by graduates of the old Philadelphia College of Pharmacy, had long been held in high esteem.

"To them Banting turned for help.

"And soon enough Lilly had insulin on the therapeutic map. Every stockyard in the country had a chance to do its bit, and shortly, out of the Lilly laboratories in Indiana, the product streamed in endless vials—and at a comparatively reasonable price. It was released into the hands of the medical profession and never before in the history of medicine had the introduction of a new drug been so sanely—so safely accomplished."

. . . . . .

In Indianapolis—just a few days ago; just about a decade after the above-related episode and as a splendid sequel to the story, the magnificent Lilly Research Laboratories were formally dedicated. Hundreds of notables from near and far came to participate. Banting himself was there, but now as Sir Frederick Banting, to tell the early story of insulin. Sir Henry Dale, of London, addressed the vast assembly on "Chemical Ideas in Medicine and Biology," and the outstanding Dr. Irving Langmuir spoke on "The Unpredictable Results of Research." Josiah K. Lilly, president of the board, represented his firm and his profession upon the rostrum, speaking on "Research in Manufacturing Pharmacy." Eli Lilly presided over the memorable ceremony.

After the ceremonies the new laboratories were opened for inspection.

. . . . . .

Said Pasteur: "Take interest, I implore you, in those sacred dwellings which are designated by the expressive term 'laboratories.' Demand that they be multiplied, that they be adorned; these are the temples of the future—temples of well being and of happiness. There it is that humanity grows greater, stronger, better."

Surely there can be no finer motives or incentives than those embodied in the research programs of our pharmaceutical leaders—and humanity owes a debt of gratitude to those whose ample vision finds this upward way.

More power, we say, to the Lilly Research Laboratories and to all such enterprises the world over.

IVOR GRIFFITH.

A Test for Ethylene Glycol in the Presence of Glycerin. A. W. Middleton. *Analyst. 59,* 522-524 (1934). The test is applied as follows: To 10 cc. of the solution to be tested, 2 cc. of nitric acid (1.42) are added and the mixture is evaporated to approximately 1 cc. Five cc. of 20 per cent. ammonium chloride solution are then added and the dish is allowed to cool. The liquid is made slightly alkaline by adding 10 per cent. sodium hydroxide solution, 1 cc. at a time, until there is a slight odor of ammonia, after which the solution is boiled until no odor of ammonia is detectable. One cc. of 10 per cent. barium chloride solution is next added, and after about fifteen minutes (during which time the liquid is cooled in a bath of cold water) the precipitate is filtered and washed with about 5 cc. of water (until the filter paper is nearly free of stains). The precipitate is then rinsed into a boiling tube by means of 5 cc. of water, 7.5 cc. of 2 N sulphuric acid were added, and the mixture is heated just to the boiling point. The resulting oxalic acid solution is cooled and filtered. The filtrate is treated with 0.6 N. potassium permanganate solution until no more is decolorized *in the cold.* It is then boiled, and any further decolorization of the potassium permanganate is regarded as showing the presence of oxalic acid, and hence the presence of glycol. The test can be used for the detection of glycol alone and for mixtures of glycol with glycerin containing up to 75 per cent. of the latter. It is sensitive to 0.1 gram of glycol in 10 cc. of aqueous solution, and will detect as little as 0.3 gram of glycol in the presence of 0.7 gram of glycerin in 10 cc. of aqueous solution.

SELECTED EDITORIAL

OUR STAND ON FEDERAL DRUG LEGISLATION †

By Robert P. Fischelis *

LAST year, due to lack of knowledge of the facts or misinformation, the profession of pharmacy was classified in the minds of many laymen and members of other professions as an opponent of new legislation to strengthen the Federal food and drug law. Out of the maze of propaganda for and against the enactment of more stringent regulations to govern the manufacture, distribution and advertising of food, drug and cosmetic products, we emerged, in the eyes of the public, as weak proponents of obviously necessary reforms and as strong opponents of regulatory measures containing the necessary "teeth" to enforce the reforms which we really favored. It is unfortunate that the American Pharmaceutical Association, which has prided itself since its organization in 1851, upon being a champion of legislation to suppress the distribution of inferior, adulterated and deteriorated drugs, should have been placed in this position. Year after year, the association has placed itself on record against fraudulent practices in the manufacture, sale and advertising of drugs and cosmetics. It is also on record in favor of at least partial formula disclosure of so-called patent medicines and other secret remedies.

In all of the publicity attending the various hearings on proposed drug and cosmetic legislation last year, the voice of the American Pharmaceutical Association was not heard because it was submerged in the unified opposition offered by the "drug trade" to certain features of the legislation proposed by the Government to stamp out evils which have crept into the food, drug and cosmetic industries and with which the Government is unable to cope under existing law.

We can very well be proud of the efforts made by the American Pharmaceutical Association in its attempt to present pharmacal opinion in unified form through the National Drug Trade Conference which the association called into being. However, when interests

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* President, American Pharmaceutical Association.

represented in the conference indulge in the type of propaganda which was used last year to defeat proposed food, drug and cosmetic legislation, we must take steps to make our position clear and let it be understood in no uncertain terms that we are not a party to such a program.

The new Congress will undoubtedly give attention to food, drug and cosmetic legislation. The American Pharmaceutical Association is convinced of the necessity for constructive and, in some respects, drastic revision of existing food and drug laws. As the acknowledged representative of professional pharmacy in the United States, it will endeavor to lend the full weight of its influence toward the enactment of reasonable, effective and enforceable legislation which will protect the consuming public against fraud of all kinds in the drug and cosmetic industry.

It is recognized that laws which do not provide for adequate enforcement machinery had better not be written into the statute books. The law-abiding citizen must put up with many irksome restrictions of his liberties in order to make it possible to apprehend the enemies of society. The food, drug and cosmetic industries cannot expect the Government to protect the public against exploitation by the unscrupulous, with its incident protection of the honest manufacturer and distributor, unless sufficient power is granted to make law enforcement a fact and not a farce.

A New Spot Test for Potassium. N. S. Poluektoff. *Mikrochemie 14,* 265-266 (1933-34). In the presence of para-dipicrylamine (hexanitrodiphenylamine), potassium forms a slightly soluble orange-red salt. The test is carried out by placing a drop of the solution to be tested upon a filter paper and adding immediately a drop of the solution of the reagent (0.2 gram of para-dipicrylamine dissolved in 2 cc. of normal sodium carbonate solution and 20 cc. of water by boiling, the solution being filtered when cold). One or two drops of 2 N hydrochloric acid are placed on the orange-red spot which forms immediately but which does not change color if potassium is present. In the absence of potassium the color changes to a yellow. Lithium, sodium, strontium, calcium, magnesium and barium do not interfere. Ammonium salts should be removed if present in excess. Rubidium and cesium interfere in this test.

ORIGINAL ARTICLES

RHUS TOXICODENDRON*

(Poison Ivy)

By William J. Stoneback

THE information collected and recorded in this paper is presented with the hope it will benefit two groups of people, first the larger group, those susceptible to "Ivy Poison," who do not recognize *Rhus toxicodendron* as a possible source of offense, and second, the smaller group, fellow pharmacognosists, charged with the responsibility of identifying *Rhus toxicondendron* in its fresh or dry condition for commercial purposes.

Recognition by the former group will depend upon their learning by keen observation the growing habits and characteristics of the plant while the latter group need only apply the tests to be convinced of their usefulness.

Botanical Description of Plant

"Rhus toxicodendron of American authors (Rhus radicans, L.), commonly known as Poison Ivy, Three-Leaved Ivy or Poison Oak, is a woody vine, climbing by aerial roots, or an erect bushy plant having several races that differ in habit and shape of leaves. The leaves are petiolated, three-foliate, each leaflet being short petioled, ovate or rhombic, entire or slightly sinuate or dentate, inequilateral, rounded or narrowed at the base (Fig. 1). The inflorescence is an axillary panicle of small green flowers. The fruit is a glabrous or slightly pubsecent, grayish drupe" (1).

Growing Habits

The plant adapts itself to almost every type of soil, flourishing abundantly in wood and field, especially noticeable along pathways, roadways, embankments and fences, and unless completely uprooted in gardens, borders and hedgerows.

Wherever located, those unfamiliar with its identity and sensitive to its poisonous qualities, on contacting the leaves, stems or roots,

*Preliminary studies presented to Pennsylvania Pharmaceutical Association, Wernersville, Pa., June, 1932; Plant Science Seminar, Toronto, Canada, August, 1932.

suffer the torments of severe itching, with considerable swelling, blotchy eruption and finally escaping serum. If the site of irritation is scratched, bacteria will enter, causing greater inconvenience and occasionally disastrous results.

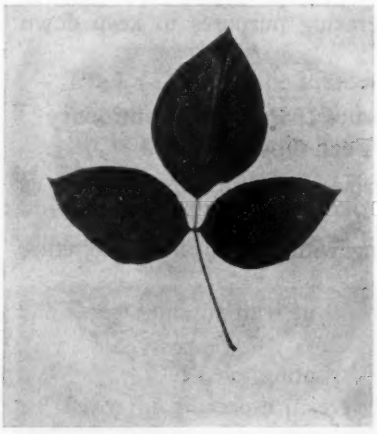

Fig. 1. Leaf of Rhus Radicans, L.

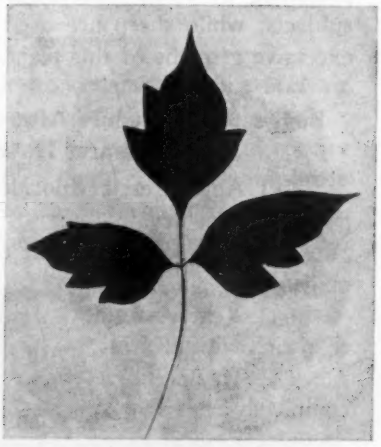

Fig. 2. Another Form of Rhus Radicans (E. U. S. and E. Canada).

Prophylaxis

If aware of susceptibility, the individual may acquire immunity or partial immunity, or save considerable discomfort by observing one or more of the following suggestions:

(1) Becoming desensitized (by direction of a physician).

(2) Smearing the hands, face and other exposed parts with a solution composed of Tincture Ferric Chloride 20 cc., Glycerine 50 cc., and water 30 cc., when handling unknown plants or when tramping through territory known to be infested with Rhus radicans (2).

(3) By thoroughly washing the surface which has been in contact with the poison with alcohol, kerosene, ether or gasoline, the poison will be confined to its original location. There is no danger from contact with the poison if the surface is thus washed within ten or fifteen minutes (3).

(4) By having clothing dry cleaned after an excursion through an infested area, since articles of apparel serve as excellent carriers of this poisonous substance, which is very adhesive and almost impossible to remove with soap and water.

(5) By not handling pets such as cats, dogs, rabbits or sheep that have been exposed to the plant, for they, too, are excellent carriers.

(NOTE: Curious, but true, practically all animals are immune to poisoning by *Rhus toxicodendron,* and therefore not fit laboratory subjects, while sheep are used for grazing purposes to keep down excessive growths of this plant.)

Suggested Procedure After Exposure If Previous Cautionary Measures Have Not Been Observed

(1) Apply ferric chloride-glycerine-water mixture as soon as possible. Let dry.

(2) Or, localize area by cleansing with alcohol, kerosene, ether or gasoline.

(3) Remove results of either treatment with running water and soap rich with alkali.

(4) If itching continues after irritating oleo-resin has been completely removed, apply a lotion or cream especially prepared for

Fig. 3. Old Quarry Hole Showing Dense Growth of Rhus.

this purpose by a reliable individual or firm (for not all preparations of this type are efficient).

(5) Severe or neglected cases may require the care of a physician.

Toxic Principle

Pfaff (4) called the toxic principle toxicodendrol, while McNair (5) concludes that it is a polyhydric phenol which he calls lobinol.

"It is known that the poisonous principle of the several species of Rhus is an amber-red, non-volatile, liquid resinous substance which combines with the alkali hydroxides to form nigrescent compounds and otherwise behaves like certain phenolic compounds" (6).

Fig. 4. Rhus Growth on Tree Trunks.

Observations

The leaves of *Rhus toxicodendron* before collection are shiny when compared to the dull appearance of foliage leaves of many other plants.

The leaves may be collected by persons sensitive to the toxic principle without danger of infection provided proper precautions are observed either before or immediately after contact.

If leaves are collected commercially care must be taken to spread in thin layers, in a dry, shaded environment with occasional turning to insure even drying. If this cautionary measure is not observed, rapid heating develops with consequent bleaching, producing poorer grades of the drug. Properly dried leaves show a dark green dorsal surface and a light green ventral surface.

The dried leaves are brittle.

When the powdered drug is desired a ball-mill is the safest device to use in its preparation.

A fifteen-pound sample of fresh leaves was dried under conditions that simulated ordinary commercial production. The sample contained 75.89 per cent. of volatile matter calculated as moisture. Dried to brittleness, it is an easy matter to powder small quantities with an iron mortar and pestle.

The location of the toxic principle is easily demonstrated with aid of a microscope when samples of the whole, ground or powdered leaf material are examined after a short period of maceration in a 10 per cent. alcoholic potash solution.

If a microscope is not available it is necessary to bleach the material before microscopic examination. This may be accomplished by macerating the material for at least one-half hour or until completely softened when the alcoholic potash solution is removed and the specimen thoroughly washed with water. The resin canals will appear black and will be found coursing along the mid-rib and veins.

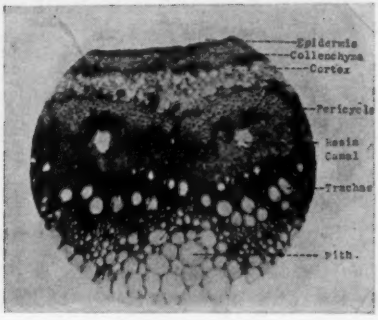

Fig. 5. Showing Resin Canals in Transverse Section of Petiole.

The resin canals are located in the phloem patches of the fibro-vascular bundles. (Fig. 5.)

Darkened areas were noted in trichomes, tracheæ, certain phloem cells, in the lumina of the sclerenchyma cells of the pericycle (in petiole) and in certain cells of the collenchyma tissue after transverse sections were treated with the reagent and examined microscopically. (Fig. 6.)

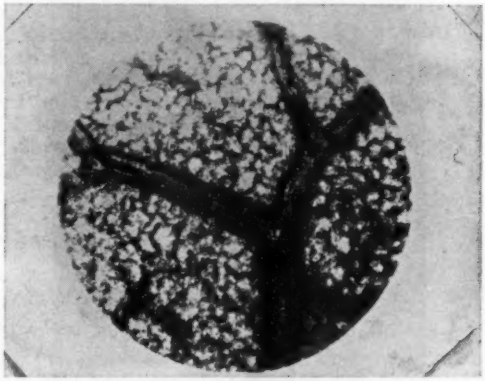

Fig. 6. Showing "Nigrescent Compounds" in Resin Canals of Veins.

An experiment to demonstrate movement of the toxic substance is easily prepared. Cut a fresh leaf in half; macerate in 10 per cent. alcoholic KOH solution until nigrescent compound is formed; replace reagent with 5 per cent. aqueous chloral hydrate solution; observe with a microscope. Small, dark, oily globules will be seen moving along the resin canals and exuding where veins have been severed. When movement ceases, one large globule will be found at each exudation point. Old, dried material responds in part, but differs in appearance of exudate and rapidity of movement. The exudate consists of small cylindrical segments and the rate of movement is much slower (a segment, traced and timed with a stop watch, moved at the rate of .8 mm. per fifteen seconds).

Non-glandular, uniseriate, five to ten-celled trichomes gradually tapering to a pointed apical cell are found on the margins and directly over the mid-rib and veins on the ventral surface, thirteen to fifteen wide at base and up to 485.80 in length.

Trichomes of the same type are found on the petioles and stems.

The contents of these trichomes darken when treated with Ferric Chloride T. S. or an alkali hydroxide. Youngken, working on *Rhus venenata,* observed the same phenomenon (1). Darkened resin fragments were observed on their outer surface after treating trichomes with alcoholic potash solution. (Fig. 7.) Since trichomes easily

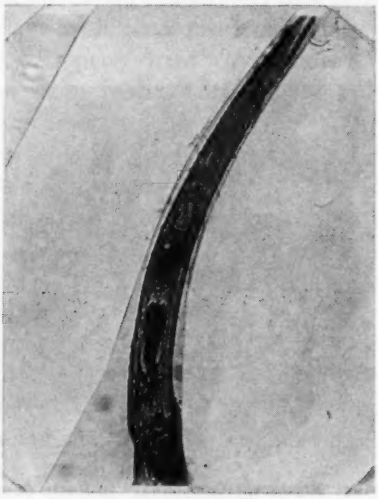

Fig. 7. Typical Trichome With Darkened Contents After Treatment With Ferric Chloride T. S.

detach, this may account, in part, for some individuals showing symptoms of ivy poisoning without actually contacting the plant.

Crystal fibers surrounding the fibrovascular bundles contain rosettes of calcium oxalate that measure up to 14.1 μ in diameter.

Monoclinic prisms of calcium oxalate measuring 23.5 μ in length are found in the cells of the mesophyll region.

"The juice becomes black on exposure to air and leaves on linen or other cloth a stain, which cannot afterwards be removed by washing with soap and water, or by alcohol either hot or cold, but deepens with age. Ether dissolves it. When the juice is applied to the skin, it frequently causes inflammation and vesication" (7). This characteristic was verified.

Conclusions

Much discomfort can be avoided if a "susceptible" will learn to recognize *Rhus toxicodendron* or observe a few simple precautions when in an infested area.

That the trichomes are capable of transmitting the toxic principle due to small particles present on their outer surfaces.

Plant material a year or more old will show the "nigrescent reaction" and when an alcoholic extract of such material is applied to the inner forearm, irritation is produced.

That every effort should be made to eradicate this troublesome plant, preferably by those not susceptible to its poisonous qualities.

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Volumetric Determination of Methylene Blue and Picric Acid. A. Bollinger. *Proc. R. S., N. S. W. 67,* 240. Through *Pharm. Jour. 133,* 245 (1934). Methylene blue and picric acid react to form a well-defined picrate which is insoluble in water, but very readily soluble in chloroform. This fact can be utilized in the determination of picric acid in dilute solution by titration with standard methylene blue solution, or vice versa. For the determination of methylene blue with picric acid, a solution of the former is placed in a separator with from 10 to 100 cc. of chloroform and the picric acid solution is run in slowly. The precipitate is extracted readily by the chloroform, forming a green solution. If some of the precipitate does not immediately dissolve, more chloroform is added. The end-point of the titration is very sharp and is reached when the aqueous layer becomes colorless. As the end-point is approached, the colored chloroform layer should be drawn off and more chloroform added. The picric acid solution should be prepared with chemically pure material and should contain 2.29 grams of picric acid per liter. It should be standardized against a solution of chemically pure methylene blue, containing 3.74 grams per liter. If the unknown solution contains excess of methylene blue it should be precipitated completely with an excess of picric acid, and the excess of the latter back-titrated with standard methylene blue.

REPORT OF THE COMMITTEE ON BIOLOGY AND PHARMACOGNOSY OF THE PENNSYLVANIA PHARMACEUTICAL ASSOCIATION

TO PRESENT in a brief report a satisfactory, adequate survey is a human impossibility, in the opinion of the chairman of this committee. I trust you all agree with this opinion so that you may condone the obvious shortcomings of this presentation.

It is a fascinating experience to take a bird's-eye view of the results, some brilliant, some obscure, achieved in the short space of one year in the field of biology and pharmacognosy—in spite of the world-wide economic misery, affecting obviously, all laboratory workers as well as other laborers.

Biology

Glands: In Philadelphia a few months ago, Dr. George Crile, the illustrious director of the Cleveland Clinic, presented evidence that suggested the classification of land animals on the basis of energy, rather than form and structure. After a comparative study of the brains, thyroids and adrenal glands of 747 animals of ninety-one varieties, he found a definite relation existing between the weights of the thyroid and the adrenal glands, depending upon the nature of the energy required by each species of animals in the fight for survival. He concluded that the size of the thyroid gland maintaining the level of activity of the brain, depends upon the rate and constancy of demands for energy production, while the size of the adrenals depends upon the need for sudden use of energy.

He divided animals in three groups, (1) the attack or escape group, as the lion and rabbit, relying upon release of energy in attack or escape; (2) the protected group, as skunk or porcupine, relying for safety upon chemical or mechanical devices; (3) the strategy group with man supreme, relying for survival upon the direction of energy by a controlling brain. Discussing the evolution of the strategy group, resulting in larger thyroid and brain, he warned: Besides learning to fly faster than the bird, use more strength than the elephant, outpoison the snake, calm the fears of the more useful herbivora, exclude his most ancient enemy, the carnivora, man has domesticated the plants and many bacteria, but in turn is threatened himself by bacteria and insects and particularly by the breaking down of our mechanisms through the pathological physiology of the neuro-

glandular system, a mechanism by which he rose to command the organic world, but which he must learn to control to assure his survival.

Cancer: In the battle for control of cancer, Dr. W. C. MacCarty, of Rochester, Minn., after studying over 2000 cancers, gave new hope, stating in Cleveland recently: There are enough known facts, if they were but properly and extensively applied, to solve the cancer problem. The patient with a lesion smaller than a quarter, "the Achilles Heel of Cancer" must be considered seriously; these early cancers can be found and safely removed. Cancer is a problem of health in general, external and internal cleanliness and heredity, a problem of prevention, meaning early recognition and treatment of things which frequently end in cancer—a disease which is the result of a disease. Greatly encouraging is also the report that the extract of growing tumors has been found to check other tumor growth in experimental animals, and that this fact suggests the formation of antibodies.

Hormones: A comprehensive survey of the year's progress in the field of endocrine glands and their hormones has just been published in the May number of the *Prescriber,* with numerous references to original publications. Anti-hormones are also believed present in our bodies, acting as stabilizers, controlling the intense activity of the rushing, body regulating hormones. Of particular interest have proven the sexual hormones, some in connection with their influence on speeding plant and animal growth, one even reported to have stopped the growth of malignant tumor in mice.

Vitamines: A. In connection with its relation to infections, Sutherland in Brit. Medical Journal I. 791, 1934, reported the susceptibility to infection and resistance to established disease were the same in two groups of children, one treated with Vitamin A, the other not. Carotene from carrots was transformed into Vitamin A in both kidney and liver of dogs in experiments of Turner (Proc. Soc. Exp. Biol. Med. 31, 866, 34). The local application of colloidal solutions of carotene in forty-four cases of eye diseases as Keratitis improved symptoms and had a marked analgetic effect. Karrar in Chem. Rev. 14, 17, 34, has accomplished the synthesis of Vitamin A and established the structural formula; -d, B, jr carotenes are the only naturally occurring pro vitamines; four other carotenes with pro vitamin action have been synthesized.

$B._2$ (Lacto Flavine.) Lacto Flavine gave weight increase in rat experiments of forty grams in fifty days equivalent to Vitamin G preparations, suggesting that it is identical with Vitamin B_2 or Vitamine G. (Z.f. Physical Chem. 223, 241, 1934.)

C. Ascorbic Acid, isolated in pure crystals, is synthesized and, obtained from natural sources, is now commercially supplied in tablets corresponding to two teaspoonfuls of fresh orange juice. The anti-infectious activity of citrus juice in experiments with guinea pigs was much greater than that accountable by the ascorbic acid content. The anti-infectious factor has thus far not been isolated from Vitamin C containing fruit juices. (Euler and Malenberg. Naturwissens-Schaften 22, 225, 1934.) The interstitial tissue (ovary) and corpus luteum in normal animals contain abundant Vitamin C; this apparently undergoes a cycle similar to that of the luteinizing cell. (Geroud, C. R. 196, 850, 1934.)

D. Excessive radiation yields poisonous substances. Ergosterol was isolated from the mold tissue of Aspergillus sydowi. (Journal Am. Chem. Soc. 56, 952, 1934.) Vitamin D corrected only one dietary deficiency, leaving other essential deficiencies uncorrected. (Sutherland in Brit. Med. Journ. I, 791, 1934.) The Council on Pharmacy and Chemistry of the Am. Medical Association plans the study of the prophylactic and curative claims that can be recognized for each of the vitamines.

Hypersensitivity (Allergy-Altered Energy)

As a great number of substances may cause hypersensitivity, skin tests have become a recognized aid in establishing the likely cause. The most important allergic groups are: 1. dusts; 2. pollen; 3. food; 4. plants and plant extracts; 5. medicines; 6. bacteria.

1. The experiments with dusts, and especially house dusts, often apparently causing symptoms of asthma, are inconclusive, although mold spores of the common bread and fruit molds are suspected among the causes. Many cases of hypersensitivity are definitely attributed to feathers of birds, as parrots, chickens, ducks or geese, or to hairs, human, cat, dog, rabbit, cattle and scales of horse hides.

2. At least twenty-two different pollens from the rag weeds, grasses, from clover, timothy, sunflower; rose and dandelion, fir, elm, birch and willow, and others are held responsible causes. According to Beckman in Lancet 1933 P. 1227-9, 69 per cent. of 518 cases obtained relief from hay fever, taking internally a dilute mix-

ture of hydrochloric (eighty-two pts.) and nitric acids (eighteen pts.), in water after each meal and as near to midnight as possible. Curiously Kellogg previously advised treatment with sodium bicarbonate. Other workers suggested the use of irradiated ergosterol and amino-acids, or of large doses of cod liver oil and yeast to relieve hay fever.

3. Among the foods, strawberries, beans, almonds, potatoes, oats and wheat, tomatoes, eggs, chicken, ham, milk and cheese, and coffee, are more frequently mentioned as causes.

4. Of the many plants and plant extracts, ivy poisoning, the best known and worst feared, is caused by a non-toxic oleo-resin "toxicodendrol," occurring in leaf, stalk, root and air-borne pollen. Injections of ivy extracts, especially when repeated after twenty-four to forty-eight hours causes relief in many cases, lessening the itching and hastening the process of healing. As a prophylactic measure, immunity against further poisoning has been attempted by the injection of an immunizing preparation of poison ivy extract in almond oil, injected intramuscularly with a dry needle. To prevent oozing and spreading of the extract, adhesive plaster is placed over the injection site. Of fourteen patients of the State Institute for Feeble Minded of New York, formerly afflicted with ixy poisoning, despite the usual amount of exposure, only three again developed the symptoms during the year 1933.

5. Drugs and Medicines: An interesting book written by Humphrey Rolleston, London 1927, covers the subject of drugs, foods, of psychological and physiological idiosyncrasies, of allergic diseases. S. M. Feinberg in his book on asthma, hay fever and related disorders, 1933, refers to the sensitiveness due to certain drugs, causing skin inflammations, giant hives, nasal symptoms, asthma and abdominal pain. These reactions in some instances may be serious and severe. According to Feinberg, the most common drug in this connection is aspirin, having caused some of the worst attacks of asthma, even after the use of only one tablet. Certain pain:—fever and cold tablets contain aspirin among other drugs. The Federal Trade Commission, according to the daily press of June 13th, charging a certain firm with misrepresentation in the sale of aspirin, stated: "Relying upon medical opinion, there are persons by whom aspirin tablets may not be safely taken, even in small or moderate doses, as well as persons who may not safely take into their systems, amounts in excess of the prescribed or usual dose;

while to some persons excessive use of aspirin is highly dangerous. Pyramidon is also frequently responsible for severe attacks, according to Feinberg. Morphine and codeine are not tolerated by some allergic patients. Quinine, belladonna, ipecac, nicotine and iodides cause hypersensitivity in patients. Iodoform causes a particularly frequent and annoying idiosyncrasy, accompanied by flushing, formation of pustules and sometimes more severe inflammations. The causative principle, according to Bloch, is the methin group contained in iodoform. People sensitive to iodoform also react to other compounds, containing a methan or methin group. Adrenaline and ephedrine, often employed to relieve asthma, also cause hypersensitivity. Even phenobarbitol frequently causes a rash resembling measles in appearance (according to Ugesk F. Laeger 33, p. 369). The hypersensitivity to pyrethrum powders and sprays is much more prevalent than ordinarily expected. (J. Am. Med. Assn., May, 1934). In a commercial plant handling pyrethrum products, 30 per cent. of the employees had itching skin diseases.

Allergic patients should be questioned before certain medicines are prescribed concerning their sensitiveness to drugs, often known to them, as they usually suffer also from other allergic symptoms, as hay fever or asthma.

Of particular interest to pharmacists is the case of hypersensitivity to ointments and vaseline in particular, reported in the Practicum of allergic diseases of Hansen, Rost and Dekker. Relief from a persistent skin inflammation was only obtained—in spite of six months treatment, by various dermatologists, after the vaseline base in zinc ointment was replaced by an aqueous suspension of zinc oxide.

Pharmacognosy-Biochemistry

Alkaloids. 1. Ergot.—Prolonged study of a drug such as ergot has revealed the complexity of its chemical composition in the isolation of another, the seventh alkaloid. (Arch. Pharm. March, 1934.)

1. Ergotinine, isolated 1875 by Tanret.
2. Ergotoxine, isolated 1907 by Barger & Carr.
3. Ergotamine, isolated 1920 by Stoll.
4. Ergotaminine, isolated 1920 by Stoll.
5. Pseudoergotinine, isolated 1931 by Smith and Timmie.
6. Sensibamine, isolated 1931 by Chinoin and Wolf.
7. Ergoclavine, isolated 1934 by Kussner.

And word reaches us that Thompson from Baltimore reported the presence of a new base in ergot this spring.

2. Cocaine.—A remarkable influence of diet upon cocaine poisoning was observed by Nedzel (J. Lab. Clin. Med. 19, 875, 1934). Ten mg. of cocaine per kg. intravenously injected caused death in two of sixteen rabbits on alkali-forming diet; in four of sixteen rabbits on acid forming diet, and no deaths on mixed diet, though the symptoms were of the same severity as those in the alkaline group—and of course much less severe in the acid series.

Toxins.—Tetanus-Toxin:—A "Hypertoxin" was produced through transformation of the toxin by incubation at thirty-seven degrees for several days, at a certain hydrogen ion concentration (ph) and in the presence of certain acids. The ph of 37 and butyric acid gave most toxic preparations—according to Legroux and Ramon: Compt. Rendues, 198, 620, 1934.

Fluorides.—Two milligrams of fluorine per day—observed in some drinking waters, was shown to be toxic to children, the fluorine effecting the enamel of the teeth.

Insecticides. 1. Cedar Oil.—Cedarized containers of the odor of cedar cannot be depended on for moth protection unless the articles are sprinkled well with flake naphthalene or paradichlorbenzine crystals, and the cracks about the doors of the closets and lids of the boxes are carefully sealed with adhesive tape. (U. S. Dept. Agri. Clip, S. N. 824.)

2. Pyrethrum.—Pyrethrum insecticides are affected by sunlight. The toxicity is lost in two or three days out of doors. The vapors of insect flowers are not toxic to insects and only mildly repellent to flies and mosquitoes, according to the N. J. Agri. Ex. Sta. Circ. 272, 1933.

3. Rotenone.—Rotenone is readily decomposed in sunlight, losing its toxic properties for sucking and chewing insects, especially aphids, in a few days, according to Ginsberg, N. J. Agri. Ex. Sta. Circ. 273, 1933. The fine roots of South American cube; (Lonchocarpus nicon) contained up to 8 per cent., the coarse roots only 2-3 per cent. rotenone, the major portion being located in the cortex. Leaves and stems of both cube and derris plants contain no appreciable amounts of rotenone. Jones J. Wash. Acad. Sci. 23, 493, 1933.

Fungicides.—Changing the soil reaction by treating with ammonium sulphate or suitably diluted aqueous ammonia, resulted in the killing of root rot fungus affecting deciduous fruit trees, and

especially nut trees, as well as cotton plants. R. B. Streets Science, P. 417, 34.

The Biochemical Researches in the chairman's laboratories in the Philadelphia College of Pharmacy and Science included:

1. The hydrolytic products of amygdalin, studied with Harry Mack; demonstrating the formation of the highly poisonous hydrocyanic acid in enzymatic and dilute acid hydrolysis and comparatively non-toxic amygdalinic acid in alkaline hydrolysis.

2. The evaluation of White Mustard studied with W. Nelson, resulting in the quantitative isolation of pure sinalbin and its approximate quantitative enzymatic hydrolysis with myrosin, thus permitting the accurate determination, for the first time, of its spice value.

3. The study of poke root, with J. H. Heisler and W. A. Hand, demonstrating the apparent presence of a toxic non-laxative and a laxative non-toxic substance.

4. The effect of alkaloids on fermentation and growth of yeast, studied by B. Melkon. Edible mushroom used as a novel nutrient medium showed satisfactory increase of growth. Strychnine accelerated growth and fermentation, nicotine depressed both, and digitalin inhibited the fermentation in the amounts used.

5. The evaluation of aloes, studied by this chairman upon the suggestion and with a grant from the board of trustees of the Pharmacopoeia, represents an apparent solution of this difficult problem, using daphnia as a test animal and proving the decided superiority in laxative action of curacao aloe as well as of the resin, remaining, over aloin, isolated from the aloe.

6. Rotenone, considered harmless to higher animals while toxic to insects, was found by the chairman to be fatal to all animals tried, low and high, as rats, rabbits and cats, under certain conditions after starvation, proving anew the importance of conditions in the alimentary canal, in connection with drug action.

Respectfully submitted,

J. W. Allen,
H. Joseph Brandl,
Edward P. Claus,
Frank H. Eby,
Joseph H. Kelly,
J. G. Maust,
Arno Viehoever, *Chairman.*

AERIAL POLLEN SURVEY BEGUN BY THE PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE

A SURVEY to be conducted by a fleet of airplanes was officially inaugurated at the Philadelphia College, September 20th, in the presence of a distinguished group of scientists and health authorities. President Wilmer Krusen presided and Dean Charles H. LaWall explained the nature and purpose of the survey to the group gathered in the Philadelphia College auditorium.

The survey is intended to measure accurately the density, nature and distribution of air-borne pollen in the upper atmosphere and

Fig. The Investigator.

will be carried on over the Philadelphia metropolitan area extending in many directions as far as forty miles from the city center and also along the New Jersey coast in and around Atlantic City and seaward for twenty miles. Daily flights are scheduled for the remainder of the 1934 hay fever season and throughout the season for the next four years.

Dr. Theodore B. Appel, Secretary of Public Health for the Commonwealth of Pennsylvania, and Dr. J. Norman Henry, Philadelphia Health Director, both enthusiastically endorsed, the project in addresses at the meeting marking the start of the survey.* Other

* Dr. Appel's address is printed herewith.

speakers were Dr. Randle C. Rosenberger, chairman of the Committee on Air Pollution of the College of Physicians and Surgeons and chairman of the Air Hygiene Commission of Philadelphia, and Dr. Arthur C. Morgan, Secretary of the Pennsylvania Board of Medical Licensure and widely known physician.

To commemorate the occasion, a model of one of the planes to be used in the investigations was presented to the College. The presentation was made by Dr. Henry K. Seelaus of the Philadelphia College laboratory of immunology who, with Dr. A. H. Zifferblatt, of the staff of this laboratory, are in immediate charge of the survey. General direction rests with Dean Charles H. LaWall and Dr. Louis Gershenfeld, head of the college department of bacteriology and hygiene. Biological aspects of the study, such as identifying and counting the pollen grains, will be under the direction of Dr. Marin S. Dunn, head of the biology department.

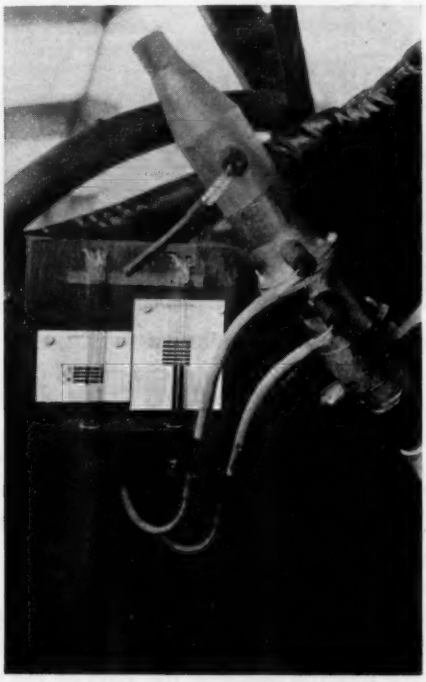

Fig. 2. The Air Collector and Measuring Device.

The apparatus for carrying on this work was developed in the Philadelphia College engineering laboratories under the direction of Frank N. Moerk, assistant professor of manufacturing chemistry. The airplanes with which the survey is being made were made available by Richard Mark, a patient of Dr. Seelaus and Dr. Zifferblatt, and himself a hay fever sufferer.

At the conclusion of the exercises three planes being used in the survey flew over the Philadelphia College campus, officially marking the beginning of this pioneer study.

An abstract of Dr. Appel's address follows:

"There are many duties associated with the office of Secretary of Health of a Commonwealth like ours which are pleasant—others, unfortunately, which are the opposite. But my presence here today distinctly is of the first type. You are about to inaugurate an important and exhaustive survey through the Department of Immunology of the College, which I thoroughly believe will throw light on many of the phenomena now little understood which confront the student of this particular allergic condition and which will, I feel equally confident, be of great importance in the protection of the public health from other conditions.

"I am particularly pleased and I congratulate you gentlemen that this survey should be initiated and carried out by a Pennsylvania institution—The Philadelphia College of Pharmacy and Science—the oldest and most important College of Pharmacy in the United States, which since 1821 has been carrying on its splendid work of scientific training and research.

"You purpose, as I understand it, by following a well-prepared program through continuous observation under all kinds of meteorological conditions, to accumulate data having to do with the presence of dust and pollen in the air at graduated altitudes, in order to explain if possible certain of the at present not understood phenomena which are apparent in our study of hay fever and its allied conditions.

"After all our knowledge of many of the phenomena of nature is very far from complete, and often not correct. We know that at a fairly uniform height above the earth's surface there is a steady and continuous easterly drift at a rate of from 80 to 100 miles per hour; that areas of high and low pressure indicating periods of storms and clear weather, heat and cold, follow each other across

the country in this same direction; that beneath this easterly drift due to convection currents and subject to seasonal, diurnal or incidental conditions the winds are variable, and we know that in the air transported by the winds there are particles of dust, animate and inanimate, which may and often do cause discomfort and disease to human beings. We also know that in the careful study of the disease map of the country, in epidemic years the prevalence of certain diseases can be progressively traced from Asia, across the Pacific and then after invasion of the western coast gradually spread across the country to the Atlantic, and not entirely explainable by routes of travel.

"An old professor of mine, Dr. H. C. Wood, eminent in therapeutics, was accustomed to say to the pathologist, 'Tell us the cause and nature of the disease, and we will cure it.' The more information we possess as to the cause and nature of any disease, the better can we control it, and this survey as outlined, in all probability will definitely increase our knowledge of the methods of transmission not only of hay fever, but of many other air-borne diseases.

"I think last summer we all had an ocular demonstration of the distance dust will travel if we remember the dust storm which brought to us tons of dust from the drought-stricken areas of the midwest, and when as I understand your survey contemplates not only the determination of the various types of pollen found in the air, but also of the types of bacteria adherent to the dust, the attractiveness and importance of the possible results secured becomes much greater.

"The many variable factors you will encounter and which must be properly correlated, such as rain, electric storms, nightfall humidity, air pockets, remind me of a recent survey carried on by agents of the Health Department to ascertain definitely the advance and retreat of the salinity curve in the Delaware for the purpose of knowing the effect of possible future abstraction of water from the headwaters for municipal water supplies, canals and the like. These engineers had to know variations of rainfall evaporation, flood and drought flows, tidal variations and a dozen other variables and correlate them into practically a mathematical formula, and to attain your end you must follow the same procedure of observation, check and counter check.

"Hay fever is definitely an allergic disease, depending upon two factors, the presence of one or more proteins usually but not always found in the pollen of certain plants, but also in certain foods as well, and an individual especially sensitized to that specific protein.

"The analogy with an infectious disease, with its causal bacteria and the susceptible victim is apparent. Hay fever is not dependent upon contact, but is definitely air borne. At first our understanding of its transmission appears to be simple. Given a supply of the proper pollen and sensitized individuals, naturally one would expect the continuous and uninterrupted presence of the distressing symptoms among the unfortunate. But this is not so. There are periods during the annual season when there seems to be an ebb and flow of disturbance without reference to the presence of the pollen. Are these variations due to an alteration of the sensitiveness of the individual or are they due to some not understood variation in atmospheric conditions? We rather feel that the latter is the more potent factor. Do convection currents, rainy weather, the altered condition of dawn and nightfall cause these periods of aggravation or amelioration of the suffering, or are they due to some obscure change in the patient? Does increased pollen density always coincide with increased symptoms? These are some of the questions to be answered.

"To digress for a moment from allergic conditions. I can conceive of great gain to be obtained in the field of knowledge of the transmission of other types of air-borne diseases. Do meteorological conditions account for the spotty spread of infantile paralysis, epidemic lethargica, or even influenza, where one outbreak occurs in one community, to be followed by another, too far off to be fully accounted for by transmission by travel, or even can typhoid germs, if they live long enough when attached to organic dust, be carried by air any distance to infect a spring or water supply? These are but samples of some of the questions on which we need more light.

"Again I congratulate the College on the inauguration of this survey, with the feeling that its success will conform to my sincere hopes."

SCIENTIFIC AND TECHNICAL ABSTRACTS

Compiled by Arthur Osol, Ph. D.

The Micro-Detection of Sugar in Urine and Other Solutions by the Use of Benedict's Solution. H. Tauber. *Mikrochemie 14,* 169-170 (1933-34). The reagent is prepared by dissolving 173 grams of sodium citrate and 100 grams of anhydrous sodium carbonate in 750 cc. of water, filtering, and adding a solution of 17.3 grams of crystalline copper sulphate and sufficient water to make 1000 cc. The test is carried out as follows: One drop of urine (filtered if necessary) is added to 0.5 cc. of Benedict's solution in a micro-test tube and heated for two minutes in a boiling water bath. In the presence of glucose, a red, yellow or green precipitate appears upon cooling. As little as 0.03 milligram of glucose per drop of urine can be detected in this test.

A New Volumetric Method for the Determination of Mercuric and Mercurous Iodides. D. Koszegi and N. Tomori. *Pharm. Zentralhalle, 75,* 532-535 (1934) # 34. The authors call attention to the fact that the iodides of mercury frequently contain an excess of mercury, hence any method which depends upon the determination of the metal is inaccurate. They propose several procedures for determining the combined halogen. In all of these methods the preliminary treatment of the sample to be tested is the same, i. e. approximately 1 gram is introduced into a 200 cc. volumetric flask, 10 cc. of 2 N. potassium hydroxide solution and 3 cc. of 40 per cent. of formaldehyde solution are added and the mixture heated for one or two minutes. After cooling, the contents of the flask are diluted to 200 cc. with distilled water and the mixture allowed to stand for a short time until the metallic mercury has settled. The mixture is then filtered through a dry filter. One of three methods may then be used for determining the potassium iodide in an aliquot portion of the filtrate. (1) A 10 cc. portion of the filtrate is acidified faintly with acetic acid (phenophthalein indicator) and 20 to 30 cc. of freshly prepared chlorine water added. By this treatment the iodide is oxidized to iodate and the excess of chlorine water is sub-

sequently removed by boiling for twenty minutes. The solution is permitted to cool, 0.5 gram of potassium iodide and 10 to 15 cc. of diluted hydrochloric acid are added and the liberated iodine is titrated with N/10 sodium thiosulphate solution. The reaction is as follows:

$$2KIO_3 + 10KI + 12HCl = 2KCl + 6H_2O + 6I_2$$

Each cc. of N/10 sodium thiosulphate corresponds to 0.003787 gram of mercuric iodide or 0.005459 gram of mercurous iodide. (2) The iodide may also be determined by neutralizing the alkali in 100 cc. of filtrate with N/10 nitric acid (phenolphthalein indicator) and titrating with N/10 silver nitrate solution in the presence of potassium chromate indicator. Each cc. of N/10 silver nitrate corresponds to 0.02272 gram of mercuric iodide or 0.03275 gram of mercurous iodide. (3) Finally, the iodide may be determined by titration with N/10 potassium bromate solution. In this analysis a 50 cc. portion of the filtrate is removed, 25 cc. of concentrated hydrochloric acid, 5 grams of potassium bromide and 5 cc. of carbon tetrachloride are added and the mixture titrated with bromate solution. The reactions involved are as follows:

$$2HBrO_3 + 10HBr = 6Br_2 + 3H_2O$$
$$3Br_2 + 6HI = 3I_2 + 6HBr$$
$$3I_2 + 3Br_2 = 6IBr$$

Each cc. of N/10 potassium bromate corresponds to 0.01136 gram of mercuric iodide or 0.01638 gram of mercurous iodide. The authors report good results for each of the three analytical methods.

Determination of Chloride and Bromide With Mercurous Nitrate. I. M. Kolthoff and W. D. Larson. Presented at *Amer. Chem. Soc.* Meeting, Cleveland. September, 1934. The method proposed by von Zombory (Z. anorg. allgem. Chem. *184*, 237, 1929) for the determination of chloride and bromide with mercurous nitrate using bromphenol blue as adsorption indicator has been studied in some detail. It was found that chloride and bromide in concentrations greater than 0.04 N and 0.01 N respectively can be titrated accurately. It is also possible to titrate mercurous mercury with chloride or bromide. The titrations can be carried out in the presence of small amounts of acid and sulphates, large amounts of Ca,

K, Na, Ba, Al and ferric Fe (with fluoride). Moderate amounts of Cu, Zn and Cd interfere. By studying the change in potential of a mercury-mercurous chloride electrode when dye was added, it was found that the chloride concentration increased. This was attributed to an exchange reaction: $Hg_2Cl_2 + 2(B.P.B.) = Hg_2 (B.P.B.)_2 + 2Cl$. It is shown that the classical interpretation of the mechanism of the indicator action according to Fajans is not correct, but that the color change is to be attributed to an exchange adsorption. Colorimetric determinations of the dye adsorbed showed that the freshly precipitated Hg_2Cl_2 undergoes a very rapid aging process, resulting in a large decrease of the surface by agglomeration of the particles.

Pectin as Emulsifier for Cod Liver Oil. W. Brandrup. *Pharm. Zentralhalle, 75,* 421 (1934), # 27. Through *Squibb Abstracts, 7,* A1023 (1934). A simple way of preparing cod liver oil emulsions without the use of emulsifying or homogenizing machines is described. The emulsifier consists of 10 grams of pectin, 12 grams of the best quality tragacanth, 16 grams of white gum arabic and 7.8 grams of white gelatin, all in the powdered state. Eighteen grams of the emulsifier are triturated with 100 grams of water and allowed to stand half an hour; 400 grams of boiling water are then slowly added with agitation followed by 400 grams of cod liver oil in about five portions. The following ingredients are also added in aqueous solution: 6 grams of calcium hypophosphite, 3 grams of sodium hypophosphite and 0.2 gram of saccharin while the following are added in alcoholic solution: 0.1 gram of vanillin, 0.2 gram of oil of peppermint, 0.2 gram benzaldehyde, 2 grams of tincture of cinnamon, and 0.5 gram of methyl parahydroxybenzoate (Nipagin M). The whole is agitated until cooled.

SOLID EXTRACTS

The Insecticide Laboratory of the U. S. Bureau of Chemistry has been surveying the promising plant material of the world in an effort to lay the foundation for growing rotenone-producing crops either here in the United States or in the tropical possessions. One of the very latest developments has been the discovery that a common wild legume, one of the perennial partridge peas found all over eastern and southern United States—Cracca virginiana—carries in its roots approximately one-half of 1 per cent. of rotenone, and up to 4 to 5 per cent. of closely related compounds almost as toxic to insects.

The work is now being organized to make a wholesale study of this species of partridge pea in an effort to locate strains carrying a higher and higher percentage of the insecticide material. And it seems not at all unlikely that a great part of what we are now spending for arsenic, agriculture will eventually salvage by producing a vegetable substitute as a farm crop. If agriculture could grow the raw material for insecticides, it would look like an ideal solution.

An interesting commentary on the origin of words comes to light in connection with the naming of the insecticidal constituent of derris root—rotenone. About thirty years ago a Japanese chemist first separated this plant principle in practically pure form. He obtained it from a plant called in their language Rohten. It belongs to that group of chemical compounds called ketones, and which in all scientific languages end in "o-n-e." So, in naming the new material, he just stuck this group ending on to the name of the plant from which it was first isolated, to make the word "rotenone."

The nature of the factor that prevents growth in dormant plant tissues, such as bulbs and tubers, is not known, but Dr. F. E. Denny, an American phytochemist, has been treating plants with chemicals and has succeeded in making the plants grow during this "rest" period.

He has taken lilac plants which have settled down for a winter's "sleep" and, by giving them a treatment with chlorohydrin gas he has aroused them from their "sleep" and caused them to start out on a new cycle of growth. They continued to grow and produced a new crop of blossoms by Thanksgiving.

Potatoes given gas or liquid chemical treatments have been caused to start sprouting quickly. This discovery is of economic importance because it makes it possible to grow two crops of potatoes in southern areas that have a long-growing season.

The dangers from arsenic, in insecticides, are already well recognized by every scientific group which has studied the matter. It is perfectly obvious that there is an ever-lurking menace from acute arsenic poisoning when we are scattering yearly thirty million pounds on various human-food plant products. Not only is there danger of too much sticking to peaches and apples, but there is often a risk of a fatal dose getting to market in cabbage, cauliflower and celery. During the past year several shipments of these products, heavily overdosed by some irresponsible farm hand, have been intercepted in interstate trade. One lot of cabbage had enough arsenic in a single head to kill a whole family.

Vitamin D, the sunshine vitamin present in liver oil and green vegetables, was called the salvation of teeth by Dr. May Mellanby, British Medical Research Council investigator. It helps to prevent and arrest dental decay or caries even in imperfect teeth. Beautiful teeth are found in Eskimos who get their vitamin D from blubber and in natives of the tropics who get theirs through exposure of naked bodies to the ultraviolet rays of the sun.

Synthetic vitamin C, called ascorbic acid, in its first actual use on medical patients, is producing very striking and unexpected disease conquests, the British Association for the Advancement of Science was informed by Prof. A. Szent-Györgyi, the Hungarian chemist who played a major role in the artificial manufacture of this important vitamin.

The mouth disorder known as pyorrhea, a certain kind of hemophilia which is a disease of bleeding, certain forms of hemorrhagic nephritis, and several other diseases against which medicine was helpless, are seemingly being cured by ascorbic acid. Ascorbic acid is not a cure for hereditary hemophilia.

Isolation of the heavy element protactinium has been achieved, Dr. Aristid Von Grosse, assistant professor of chemistry, University of Chicago, told the American Chemical Society.

Protactinium is the first chemical element to be isolated in the United States, although several elements have been claimed to be discovered here, Dr. Von Grosse declared.

The newly isolated protactinium is next to the heaviest element known, which is uranium with atomic number 92. Protactinium is number 91 and its atoms weigh 231 times as much as those of ordinary hydrogen. It is radioactive and continually breaks down like uranium and radium.

The importance of storing drugs and other merchandise in containers that exclude even diffused daylight or certain wave lengths of light is more appreciated today than ever. Such a new development is the green transparent wrapper which Government chemists have found useful in keeping potato chips free from rancidity, even though the packages are exposed to strong light. Many other foods rich in fats, which tend to become rancid, are now protected by low temperatures and darkness, or by airless packaging.

Two recent chemical developments show how research is achieving surprising results in some fields.

A recent development for automobile engine oils is a crystallization controller, which, even when used in less than 1 per cent. amounts, prevents thickening of the oil, although the temperature goes down to zero or lower. This should be an advantage in connection with heavy fuel oils, such as Bunker C grades, to cut down preheating expenses.

A chemical has just been developed which virtually fixes the calcium and magnesium of hard waters, but without removal or precipitation, so that the water may be used for boilers without scale formation, or for laundering with good economy.

Diamonds are dynamos; they generate electricity. This discovery was made by a British scientist, Sir Robert Robertson. Not all diamonds have this property. It is characteristic of a new type that has just been discovered by Sir Robert.

This discovery of the electrical property of diamonds resulted from the preceding discovery by Sir Robert that there are two types of diamonds based on differences in their absorption of infra-red light.

BOOK REVIEWS

THE BRITISH PHARMACEUTICAL CODEX—An Imperial Dispensatory for the Use of Medical Practitioners and Pharmacists. Published by direction of the Council of the Pharmaceutical Society of Great Britain, London. The Pharmaceutical Press, 1934, 35 shillings net. (The price does not include duty in countries where duty is chargeable.)

The first edition of this important and valuable work was published in 1907, the second in 1911 and the third in 1923. The present volume is the fourth member of the series.

During the twenty-seven years that have elapsed since the first volume appeared, most of the remedies which were daily used in medical and pharmaceutical practice have disappeared from use, and their place has been taken by synthetics, biologicals and preparations put up in ampul form for parenteral administration. This change has been accelerated during the past eleven years which have elapsed since the previous volume was issued, so we are not surprised to learn that nearly two hundred titles have been added, and that the size of the work has been increased by one hundred pages. The arrangement of the subject matter has also been radically changed. There are now four major subdivisions of the book, as follows:

Part I. General monographs on chemicals, crude drugs, etc. (pp. 1-1132).

Part II. Surgical dressings (pp. 1135-1155).

Part III. Formulary (pp. 1159-1530).

Part IV. Appendices (pp. 1534-1667).

The index occupies 107 pages.

The work is complete and thorough, but it is peculiarly British in its scope, and the plan of listing important U. S. P. preparations, with information as to their composition, has been entirely abandoned.

The official preparations of the B. P. 1932 are listed in abstract form under the monographs in Part I, while Part III consists entirely of unofficial formulas. This makes the work correspond in a general way to a combination of the U. S. P. and the N. F. in one book.

In Part IV are contained many tables, reagents and tests. This section contains an interesting and valuable chapter on hydrogen ion concentration and one on colloidal solutions.

Two of the most novel features of the work are contained in this section. The first of these is a pharmacological index which should be of particular value to a medical practitioner, while the other consists of a list of proprietary "trade names" of upward of 700 substances, official and unofficial, which are used in dispensing, together with a brief statement of identity and properties together with the name of the manufacturer, and in some cases of the English distributor also.

This work should be in every pharmaceutical working or reference library, for it contains much information of value, particularly as applied to substances which are official in the latest edition of the British Pharmacopoeia.

C. H. L.

MODERN DRUG ENCYCLOPEDIA AND THERAPEUTIC GUIDE. By Jacob Gutman, M. D., Phar. D., etc. Published by Paul B. Hoeber, Inc., New York. (First edition, 1393 pages, index included, cloth bound and priced at $7.50.)

According to the foreword the treatise is designed to meet the demand of the professor physician for information concerning the most modern therapeutic agencies placed at his command by research laboratories. It is claimed for the book that it presents without bias or comment all the popular non-pharmacopeal preparations and other remedies found useful in the treatment of disease. The pharmaceutical concerns of America spend millions of dollars yearly for the discovery and preparations of medical agents of high merit. Medicine is indeed indebted to these organizations for the many epoch-making discoveries and invaluable additions to modern therapeusis made during the past few decades; most of the curative sera, vaccines, allergens, potent drugs and endocrines are the result of their researches. The physician, however, has at present no adequate means of keeping informed on all the newer additions to his armamentarium; commercial descriptions of these reach him at inopportune times and usually find their way into the waste basket, thus seldom being on hand when

wanted; and except for the official publication of only council-accepted products, there are no authoritative sources of information embracing all the modern preparations. To provide such source is the purpose of this work. More than likely there will be those who find this book no more than a polyglot hodge-podge of already existent authorities on therapeutic products with price list and catalog clippings from biased and selfish origins. But they are wrong and narrow minded. The work is not the "who's who" of remedials. It is the "what's what"—in the democracy of drugs and drug products. The highbrow, snob proprietary or drug, approved by the all-knowing council of the A. M. A., must here keep uncomplaining company with the hoi polloi of medicine.

Fleischman's yeast, surgical maggots, salvarsan and phytin seem strange companions in a pharmacological compendium, but here they are, with a host of their kind, offering all their data.

And accordingly so, this work becomes unique—and more than useful. However, as in every similar work, errors of omission and commission have both crept in. For instance, the official name of veronal is given as diethylbarbituric acid, which is not so at all. "Barbitalum" (or barbital) is correct. "Urotropin," "formalin," "phenacetin," etc., are not even listed as official drugs. Indeed, all in all, the U. S. P. is much neglected—and, unfortunately, in the interest of the manufacturers.

And, of course, the obvious supervision which the manufacturers have had over the text describing their special products allows ample latitude for unwarranted and doubtful claims. Indeed, this particular chapter head, inserted by the author, is rather bold and misleading. The reviewer doubts very much that the meticulous and capable council of the A. M. A. would ever approve such a title as "*Effective* combinations" for the giddy galaxy of products described in the chapter mentioned.

. . . . . .

However, Gutman's Modern Drug Encyclopedia is a peculiarly useful book. There is no other book like it, and there is neither triteness nor trick in suggesting that it is a worthy admission to the five-foot shelf of books in every doctor's, every dentist's and every pharmacist's library.

IVOR GRIFFITH.

PRACTICAL EVERYDAY CHEMISTRY. (306 pages cloth bound and priced at $2.00.) Published by the Chemical Publishing Co., New York. Editor, H. Bennett.

Except for the fact that this book belies its title in that it is a formulary and not a work on chemistry—except for the fact that it cannot be in any sense considered *everyday,* and is in many respects not practical—except for these, and in spite of these objections, the book is well worth the price asked for it—to the few who can use it.

And *because* of these things it becomes a worthy companion to the Chemical Formulary, erstwhile of Brooklyn, and now removed to New York.

On the cover:

"All your life you have yearned to be able to dabble with chemicals."

In the preface:

"If you are thirsting for such knowledge and yearn to know the composition of these things and the methods of making them you will find the following pages not only entertaining, but instructive and practical as well."

In the *Context:* ("If you have yearned all your life to be able to dabble with chemicals") there is a splendid opportunity to so dabble, and to produce, in a "practical everyday way," a beautiful hot-water bottle. Here is the formula (page 234):

Pale crepe	34.375
Medium process oil	0.50
Barytes	34.00
Whiting	25.25
Zinc oxide	3.00
Dupont Rubber orange A D	0.75
10% Thionex master batch	1.4375
Sulphur	0.6785
Cure—7 minutes at 28.7 deg. F.	

or, if instead of paying a quarter for a bottle of neutral shoe cream, one wishes to prepare a household batch of it, that can be readily done by incorporating *secundem artem,* hydrowax cream with proflex and adding the other ingredients. (See page 162.)

These "everyday" ingredients, proflex and hydrowax, may be purchased from the Glyco-Products Co., Brooklyn, N. Y., specially discounted in fifty-pound lots.

The Revision Committee of the United States Pharmacopoeia

should take a leaf out of this publisher's book and offer a "Practical Everyday Pharmacopoeia" for those who love to make and mix their own "syrup of squill and ipecac."

To such the reviewer heartily recommends "Practical Everyday Chemistry" (Bennett).

IVOR GRIFFITH.

PHARMACEUTICAL FORMULAS, VOL. II (The Chemists' Recipe Book), the Chemist and Druggist Series, Tenth Edition. By C. P. Forrester, published by The Chemist and Druggist, London, England. 941 pages. Price, 15 s.

A review of Volume II of Pharmaceutical Formulas requires an initial note concerning Volume I, which made its appearance a few years ago. These volumes are the outgrowth of a "one-piece" work which originated in 1898, and which has been popular enough to demand revision and enlargement from time to time, until finally, this tenth edition was found to be so comprehensive as to require two separate volumes. The first of these was prepared to contain strictly pharmaceutical formulas and working data of official and non-official status. Now the second volume appears, covering formulas and processes for the many related fields or more or less technical subjects, so closely associated with pharmaceutical service.

Many of the older formulas still remain and a very large number of new ones have been added, so that the book represents a comprehensive composite of present-day usage. The scope of its contents can well be visualized by a review of the subjects considered, as follows:

Toilet preparations, a book in itself, covering over four hundred pages and dealing with bath products, face and toilet powders, creams and lotions of every conceivable type, shaving products, hair preparations, dental products and perfumes. Of particular interest and value in this section are the pages devoted to the general consideration of each phase of the subject, so presented as to give a real understanding of the requirements to be met. This feature, incidentally, is found throughout the book. Following the toilet articles are found sections on culinary and household requisites, cleaning materials, polishes, soaps, pastilles, varnishes, lacquers, adhesives, writing materials, horticultural and agricultural preparations, fertilizers, pest ex-

terminators, veterinary formulas, photographic formulas, beverages and miscellaneous items, as if anything could have been missed in the above assignments.

This volume is certainly of value to anyone having a bend toward developing side service features, and offers plenty of opportunity to expand along profitable lines.

ADLEY B. NICHOLS.

THE STORY OF GARDENING—From the Hanging Gardens of Babylon to the Hanging Gardens of New York. By Richardson Wright. Dodd, Mead & Co., New York.

Lounging in an easy chair, reading this book, the sorely stressed drug store man will find himself forgetting codes, price stabilization, loss leaders and a host of other vexing tribulations. He will find himself transported into his own or his neighbor's back yard. In imagination he will be walking, resting, basking in his mother's garden, or the far off gardens of old Japan, England or other remote lands.

The book tells the whole story of gardening, from the days when Adam, with a forked stick, scratched the ground and planted a seed, to the latest refinements of penthouse gardening in our modern apartments.

From the origin of garden making, the chapters lead up to the development, and through the evolution brought about by the migration and conquests of people, and the expansion of commerce.

In story and in picture we see gardens as they flourished in various eras and under different nationalities—Chinese and Japanese gardens; the formal gardens of India and Persia, with their water pools; early Greek and Roman gardens, and their statuary; Italy, the mother of gardens, with the monastic garden and villa garden as specialized types; Spanish gardens, introducing the patio and providing a basic origin for present-day gardens in California, Florida and the Southwest; formal French gardens; and Dutch gardens, with their tulips.

Various types of English gardens are considered—Saxon Roman, monastic, manor, and the beginning of naturalism—all with their influence on gardening styles in America. The most interesting section of the book deals with American garden history from the

early Colonial days to the formal Georgian influences and the specialized gardens of the present time.

In this book we have a complete and fascinating picture of gardens and gardening.

A right good place for a druggist is in a garden. His body and soul will be vivified as he handles the hoe, spade and rake. He may, with joy, grow vegetables, herbs, flowers.

The druggist should create good will by joining with his patrons in their garden clubs, and taking part in their flower shows. Plants growing inside the store in pots, or better still, in the modern metal self-watering and self-irrigating boxes, will attract and hold attention.

Some drug stores deal in garden seeds. Reading this book will help to make more sales. It is a good book to put on sale in the book department, or to add to the store's loan library.

The "Story of Gardening" will help the druggist to get into the garden game.

FRED B. KILMER.

EMULSION RATIOS

A new price list issued by Blackwell, Hayes & Co., Ltd., Birmingham, contains the interesting table of emulsion ratios reproduced below:

		Fixed Oils			Volatile Oils			Oleo-Resins			Fats		
		Oil	Water	Emulsifier	Oil	Water	Emulsifier	Oleo-Resin	Water	Emulsifier	Fat	Water	Emulsifier
Acacia	Gum	4	2	1	2	2	1	1	2	1	4	2	1
	Mucilage	8	—	3	4	—	3	2	—	3	8	—	3
Egg	Yolk	8	—	1	4	—	1	Rarely used					
	Whole	4	—	1	2	—	1						
Saponin	Tr. Quillaiæ	8	—	1	4	—	1	Rarely used					
	Tr. Senegæ	8	—	1	4	—	1						
Casein	Soluble	10	—	1	5	—	1	Rarely used					
	Milk	Used as vehicle											
Tragacanth	Gum	4	2	1	2	2	1	1	2	1	4	2	1
	Mucilage	For dispensing purposes better to use the gum											
Irish moss	Decoction 1 in 30	Used chiefly for manufacturing purposes											
Starch	Mucilage												
Wool fat	—	10	10	1									
Soaps	—	10	q.s.	1	10	q.s.	1	5	q.s.	1	5	q.s.	1
Alkali	—	80	q.s.	1	40	q.s.	1	20	q.s.	1	80	q.s.	1
Agar	—	Not more than 1 per cent. of total volume											

Another unusual feature in the price list is the inclusion of doses alongside the price column. The list also contains numerous formulæ for injections, mixtures, pills, tablets, etc.